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NOTE

ON THE

EFFECT OF THE PROPOSED MYSORE CAUVERY RESERVOIR

ON

EXISTING IRRIGATION IN BRITISH TERRITORY.

MAY 1911.

Note on the effect of the proposed Mysore Cauvery Reservoir on existing Irrigation in British Territory.

In their D. O. No. 2555, dated the 27th April 1911, the Residency have asked to be f[illegible]hed with the following information concerning the Cauvery Reservoir Project in Mysore :—

(1) Full details of the design of the proposed reservoir.
(2) Design and scope of the irrigation system.
(3) Rules for working the irrigation system so as to show the prospective effect of the scheme on existing irrigation in British Territory.

2. As regards item (1), a printed compilation comprising the reports and papers on the project is separately submitted.

As regards item (2), complete information is available concerning the reservoir in two stages. But the design and scope of the irrigation system are not yet definitely determined. The necessary surveys are in progress.

As regards the rules for working the irrigation system (item 3), I propose to discuss in this note the restrictions contemplated by the Madras Government in regard to the storing and use of the river water in Mysore Territory and to submit definite recommendations in the matter.

Information received from the Madras Government.

3. In December last, the Mysore Government were favoured with two notes on the subject, one written by the Hon'ble Mr. C. A. Smith, till recently Chief Engineer for Irrigation, Madras, and the other by Col. W. M. Ellis, R.E., Superintending Engineer, on special duty. They were received with D. O. letter R. O. C. 386-1-10 dated the 6th December last, from the Joint Secretary to the Government of Madras to the Hon'ble the Resident in Mysore.

A copy of the printed report in three volumes on the Madras Cauvery Reservoir Project was received from the Residency on the 28th April 1911.

Supply required under Mysore Reservoir project.

4. The Mysore Government propose to construct a reservoir with a masonry dam having an ultimate storage capacity of 41,500 m. cft., of which 37,100 will be available for use. It is not proposed to construct this large reservoir all at once. A beginning will be made by constructing a dam so as to store 80 feet of water above river bed equivalent to a capacity of 11,000 m. cft. This storage will be utilised to protect the existing power supply to the Kolar Gold Fields and also to give an additional supply up to 5,000 H.P. The water-supply to the existing channels below the dam will be improved. For further details reference is invited to the report on the project. Although some portion of the stored water will be used for power generation between March and May when it will not be useful to Madras, the bulk of it so used for the rest of the year will be distinctly beneficial to Madras irrigation. At present a steady flow of 500 cusecs is maintained in the river in summer by artificial means without any cost to the Madras Government. This steady supply will be at least doubled under the new proposals. The papers show that, when the scheme is fully developed, the total quantity of water proposed to be abstracted for irrigation will be 37,300 m. cft. or less than 40,000 m. cft. The quantity required for use in Mysore, as originally intimated to the Madras Government in a former communication from Mysore, was 51,162 million cubic feet; *vide* note by the Superintending Engineer on special duty, Madras, dated the 15th November 1910.

5. According to the tables given in the printed reports of the Madras project—

Effect of Mysore storage on river supply.

	M. cft.
(1) The average discharge for eight months of the irrigation season at the head of the delta in the 20 years ended 1909-10 was ...	425,555
(2) The average quantity actually sent down for irrigation into the delta in this period was	294,084
(3) The quantity which was surplussed or wasted at the Cauvery anikat was	131,471

The quantity passed down at the head of the delta irrigation is known but there is no record of what portion of it was actually used for irrigation. Mysore proposes to store less than one-third of what was actually surplussed at the anikat.

Claims of Mysore to the surplus supply.

6. In his letter Pol. No. 869 dated the 27th March 1911 to the address of the Hon'ble the Resident, the Dewan of Mysore has drawn attention to the relative extent of irrigation practised in the Madras Presidency and in Mysore. The area in Madras is 1,005,000 acres and that in Mysore only 108,000 acres. The latter is less than one-ninth of the former, while, admittedly, nearly three-fourths of the discharge obtained in the Madras Presidency is derived through Mysore. The first claim to all surplus water therefore belongs to Mysore.

What Madras Government propose to do for themselves.

7. The Madras Government propose to construct a reservoir close to the Mysore boundary capable of storing 80,000 million cubic feet or more than double the effective storage contemplated in the Mysore project. They also propose to extend their present irrigation by 355,000 acres. According to Col. Ellis' note, the storage obtainable at Metur (the site selected for their reservoir) in bad years is, if anything, less than that discharged at Sivasamudram within Mysore Territory.

In the arrangements for regulating the supply for their use, the Madras Engineers propose to utilise 190,050 million cubic feet instead of the average of 294,084 million cubic feet passed down into the delta during the past 20 years. This leaves a surplus of 235,505 million cubic feet available for storage in Mysore or Madras. The quantity required in Mysore will be about one-sixth of this surplus.

Proposals of the Chief Engineer for Irrigation, Madras, as regards irrigation in Mysore.

8. The Hon'ble Mr. C. A. Smith entertains doubts as to the ability of the Mysore Government to control the supply of water for irrigation during seasons of scarcity. So far as this project is concerned, I see no objection to guarantee that not more than 40,000 million cubic feet will be utilised in any year for irrigation within Mysore territory so long as the existing conditions continue. The discharges may be calculated at the head of the one or two canals that may be constructed, and all measures necessary may be taken to maintain correct records of discharges to the satisfaction of the Madras Government.

It is proposed to hold 2,000 to 3,000 million cubic feet in reserve always to provide against a failure of power supply. Besides, there will be storms in April and May, almost every year, which will bring in a substantial replenishment.

Proposals of Col. Ellis, Special Superintending Engineer.

9. Col. Ellis wishes to make sure that the quantity abstracted in Mysore is strictly within the quantity which is surplussed at the Cauvery dam at the head of the delta.

His suggestions to this end are :—

(1) that during periods when the discharge at the Cauvery dam is less than 7 feet on the gauge there, no abstraction should be allowed in Mysore;

(2) that the equivalent of 7 feet discharge on the Cauvery dam should be passed down the river at the Sivasamudram anikat within Mysore Territory ; and

(3) that gauges should be established above and below the Mysore reservoir for the accurate measurement of the volumes impounded from day to day.

These points may be dealt with as follows :—

The suggestion recommended in (3) may be accepted.

The Sivasamudram anikat cannot be accepted for the measurement of the discharges because there is a large area of catchment which brings appreciable supplies during the north-east monsoon below Sivasamudram.

As regards suggestion (1), the limit of 7 feet on gauge seems a hard condition. In the Table given below, it will be seen that the average depth corresponding to the *maximum* fortnightly discharges (Col. 3) has not exceeded 7 feet in seven months out of eight; in December and January, for instance, a depth of 7 feet is rarely or never reached.

The Madras Government have suggested certain heights in connection with the working of their own project but they cannot be expected to consent to give the benefit of similar regulation to Mysore until their storage reservoir is constructed. Till then, a compromise may be effected and the figures given in column 5 of the following Table adopted as the future limit of discharge for the purpose of impounding in Mysore:—

Months	Average depths corresponding to average fortnightly discharge Feet	Average depths corresponding to maximum fortnightly discharge Feet	Average depths now proposed by Madras in connection with their new project Feet	Limit of depths above which impounding may be allowed as now proposed Feet
1	2	3	4	5
June	2·1	4·5	2·9	4·5
	4·5	5·5	2·9	4·5
July	4·8	6·5	6·1	6·1
	5·6	6·8	6·1	6·1
August	5·6	7·9	5·9	6·1
	5·0	6·2	5·9	6·1
September	4·5	5·2	5·8	5·5
	4·0	5·4	4·7	5·5
October	4·4	5·6	5·0	5·5
	4·4	5·2	4·2	5·5
November	4·0	5·4	3·8	5·5
	3·1	5·2	3·8	5·5
December	2·4	4·85	3·0	5·5
	2·0	4·0	1·7	4·0
January (First half) ...	2·1	3·7	2·1	4·0

This Table is based on figures given on pages 34 and 207-212 of Vol. III of "Papers regarding the Madras Cauvery Reservoir Project."

Conclusions which stand out clear.

10. From the interchange of views that has taken place between the two Governments, the following points may be considered as settled. The admirable tables given in the Madras reservoir project show clearly to what extent the river has been used for irrigation in the delta during the past 20 years.

(1) Between March and May, and probably also in the second half of February, the entire supply of the river belongs to Mysore and no restrictions are necessary for this period.

(2) The usual period of storage will be from the middle of June to the end of August. There will be additional supply from the hot weather storms to count upon before this period, and from the north-east monsoon after this period. Usually the Mysore Reservoir can be filled by the 31st July. In these circumstances the chances of Mysore Reservoir failing are very remote.

The Madras tables show that during the twenty years ended 1909-10 the supply was deficient in six years. But in those six years, according to the tables given on pages 208 to 212 of Vol. III of the Report on the Madras project, the surplus after allowing for the "irrigation supply" limit of 7 feet on the Cauvery dam was as follows:—

Year.				Mil. cft.
1890-91	...	...	...	83,987
1894-95	...	...	...	47,605
1899-00	...	...	...	46,545
1904-05	...	...	...	112,969
1905-06	...	...	...	64,708
1908-09	...	...	...	125,613

Even without lowering the 7 feet limit there was enough surplus in all these years to fill the Kannambadi reservoir.

(3) When a reservoir is also constructed in Madras the regulation at the Cauvery dam can be arranged to a nicety. The average surplus supply then available would be sufficient for both the reservoirs. If there is any deficiency in very bad years, Mysore should have the first claim as already explained in paragraph 6 above.

Recommendations.

11. Now that the requirements of both the Governments are fully known, the way to the solution of the problem is clear. The following suggestions may be put forward for the consideration and approval of the Madras Government:—

(1) If the Madras Government still entertain any fears that Mysore may use excess water unauthorisedly in times of drought for the protection of dry crops, an assurance may be given that the quantities issued to the canal or canals will be strictly limited to the totals agreed upon. This condition may be given effect to also by providing surplus escapes or weirs, if necessary. The Mysore Government may undertake to submit to any reasonable restrictions which the Madras Government may consider it necessary to impose in order to satisfy themselves that nothing beyond the stipulated quantity is withdrawn in any year. If this is accepted, no other restrictions in connection with impounding should be insisted on.

(2) If the proposals in (1) be not acceptable, the Durbar may agree to a modified form of the suggestions of Col. Ellis as an alternative.

Correct quantities of the supply admitted into the reservoir and thence passed down into the river should be maintained from hour to hour, or day to day, as required.

Mysore may go on impounding for a week or fortnight at a time and at the end of each period, the quantities impounded may be compared with those which would have surplussed at the Cauvery dam. The difference, if any, in favor of Madras, may be returned to the river within a week from the end of the period.

The gauge readings at the Cauvery dam for the purpose of this calculation should be those indicated in column 5 of Table given in paragraph 9 above.

(3) When Madras constructs a reservoir, the limit of gauge readings should be those which the Madras Engineers have suggested in connection with their own reservoir; *vide* column 4 of Table noted above.

The art of river gauging is yet imperfect, particularly when applied to flood discharges. With the growth of years, gauging will improve in accuracy both in Mysore and Madras.

When the existing conditions undergo changes for any reason, the restrictions which Mysore at present undertakes to submit to should be correspondingly relaxed.

12. The suggestion of Col. Ellis that Mysore should store whenever there is a surplus flow at Sivasamudram after allowing the equivalent of 7 feet discharge at the Cauvery dam cannot be accepted for reasons already explained in paragraph 9 *ante*.

The correct way of impounding is with reference to the gauge at the Cauvery dam itself. But a flood at Kannambadi will take place several days before the corresponding one at the Cauvery dam. The interval will depend on the intensity of the flood. It is therefore proposed to store continuously at Kannambadi and to adjust the difference at the end of a week or fortnight.

To facilitate impounding in Mysore without inconvenience to Madras, Mysore

may lend up to 10,000 million cubic feet from its own reservoir, if required, until the reservoir is filled, or till 31st August, provided Mysore is allowed *unconditionally* to recoup itself to that extent from whatever flow there may be in the river after the latter date.

13. It is harassing and unusual for one State to control the internal distribution of water within another to the extent proposed by the Madras Government. This will probably be the first time that a control of this sort is sought to be exercised in any Native State in India.

The fact that the Madras Government have proposed an extension of irrigation by means of a reservoir of double the size contemplated in Mysore is itself sufficient proof that the Madras Government have no misgivings as to the Mysore reservoir filling without trenching on the requirements of the deltaic irrigation. Nearly the whole of the supply which they propose to impound will be obtained from Mysore and not from Madras Territory ; and yet the Madras Government object to storage within Mysore limits.

If there can be any objection to the construction of a reservoir, it is applicable to both proposals ; and as the Madras reservoir is to be twice the size of ours, the objection must apply with greater force to the Madras proposal.

14. As there can be no manner of objection to the small reservoir which forms the first stage with a capacity of only 11,000 million cubic feet, the Madras Government may be moved to accord the necessary permission to enable Mysore to commence work at once.

Further interchange of views may be necessary in respect of the larger reservoir if the proposals, made in paragraph 11 above, do not commend themselves to the Madras Government. But the foregoing review of the case clearly shows that no insuperable difficulties exist to interfere with an early and satisfactory settlement of the question.

BANGALORE,
8th May 1911.

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